

Periscope.

a.—PHYSIOLOGY OF THE NERVOUS SYSTEM.

RHYTHMIC CONTRACTION OF THE CAPILLARIES IN MAN.—Dr. Brunton has made some observations on this point. After noting the fact of rhythm in the bat's wing, the rabbit's ear, the tongue of the frog, the arteries of the connective tissue, the vena cava and pulmonary vein of the rabbit, he states that rhythmic contractile power seems to be a common property of all the blood-vessels in the body, and belongs to involuntary muscular fibres generally. Mechanical distension seems to have a similar effect in stimulating rhythm. In man Brunton observed the rhythm in cases of aortic regurgitation; when the aortic valves were incompetent the blood flows back into the heart during diastole, leaving the pressure in the arterial system low. The heart thus receives, during diastole, blood from two sources, from the pulmonary veins and aorta, so that at the next systole a very large wave is forcibly driven into the relaxed aortic system. This gives rise to the water-hammer pulse of Corrigan, and the alternate distension and relaxation of the small arteries render pulsation in them much more readily observed than ordinarily. The method of observing this is as follows: The finger-nail should be drawn once or twice up and down the middle of the forehead; a red streak is left which will sometimes remain for many minutes. This streak undergoes variations of width and brightness which are very evident to the eye, and some of which coincide with the beats of the heart. In some cases the pulsation is so evident that the pulse of the patient can be counted with ease at a distance of five to six feet. In the red streak just mentioned it is quite easy to observe, in addition to the visible pulse corresponding to the cardiac beat, a second rhythm of contraction and dilatation corresponding to the respiratory movements. In addition to these two rhythms there appears to be a third, which Dr. Brunton is inclined to regard as due to independent contraction of the minute vessels and corresponding to the rhythmical pulsations already described as occurring in the lower animals. On account of the difficulty of seizing the exact moment at which the red streak attains its

greatest and least breadth, and on account of the interference of the cardiac and respiratory rhythm, it is difficult to ascertain precisely the rate of the capillary rhythm. From a number of observations he thinks the rhythm is at the rate of one for twenty seconds, so that the respiratory rhythm is about six times, and that of the pulse twenty-four times as rapid, as that of the capillaries.—*Journal of Physiology*, vol. v., No. 1.

THE ACCELERATOR NERVES.—Dr. W. H. Gaskell has made a number of experiments upon these nerves. He selected the crocodile, for the reason that he was a cold-blooded animal whose nervous system would closely resemble that of the mammal. The accelerator nerves of the crocodile leave the main sympathetic chain at a large ganglion corresponding apparently to the ganglion stellatum of warm-blooded animals, and accompany the vertebral arteries up to the superior vena cava, where they leave the arteries, and, passing alongside the vein, anastomose with branches of the vagus in the neighborhood of the heart. Stimulation of these nerves increases the rate of the cardiac rhythm and augments the force of the auricular contractions, while stimulation of the vagus slows the rhythm and diminishes the strength of the auricular contractions. Stimulation of the sympathetic before its entrance into the combined ganglia of the sympathetic and vagus produces purely augmentor-effects. Stimulation of the vagus within the cranial cavity before its entrance into the ganglion produces purely inhibitory effects. Now, in the frog, stimulation of the vagus produces two opposing effects: the one of inhibition, the other of augmentation. From the above experiments it is seen that the vagus of the frog is in reality the vago-sympathetic; that it is necessary, in order truly to investigate the nature of inhibitory action, to experiment upon that portion of the vagus nerve which lies within the cranial cavity, and is therefore free from admixture with the opposing sympathetic fibres; and that finally the so-called "accelerator" nerves ought to be termed "augmentor," or, perhaps better, simply cardiac sympathetic nerves, for acceleration is only one of their functions.—*Journal of Physiology*, vol. v., No. 1.

STIMULATING PERCUSSION.—Dr. J. Mortimer Granville made a communication before the English Physiological Society upon the results obtained by percussion with his percuteurs. He summarized his results under two heads: "Sensory Phenomena" and "Motor Phenomena."

Sensory Phenomena.—The sensory impression produced by percussion at a fairly high speed is divisible into two phases or stages: (a) the primary or direct—that is, the strictly local or immediate sensation, which is either slight tingling or pricking, or smarting; (b) the secondary, or indirect, which is partly propagated and partly induced. This varies greatly with the individual

subject, and apparently in proportion to the density of his tissues rather than the general quality of "sensitiveness," for strongly-built and healthy men often feel the secondary effects of percussion more distinctly than "highly sensitive" women. The galvanometer does not indicate any evolution of electricity.

Motor Phenomena.—The motor phenomena which percussion is capable of eliciting are either directly reflex or so far "organized" as to be independent of the will. Consequently if the centres with whose action consciousness is associated come into operation they inhibit the response of the normally subordinate centres. It is only when either the attention is diverted or there is some block in the line of communication between the volitional and the automatic or reflex centres, so that the last-mentioned are able to act independently or in spite of restraint and control, motor phenomena can be obtained by percussion. In locomotor ataxia, the tibialis anticus, the peronei, and the extensors can be thrown into a spastic condition with a contracture nearly resembling cramp, but the moment the patient brings the will into action he can overcome the contracture and the phenomenon disappears. A notable fact is the induction of movements in an opposite limb by percussion on the other, although the two legs have been extended on different chairs, and every precaution has been taken to avoid the transmission of the mechanical stimulation.—*Journal of Physiology*, vol. v., No. 1.

CONTRACTION OF THE VAGINA.—Dr. Jastreboff has made a series of experiments upon this subject, using rabbits. Their vagina normally has rhythmic spontaneous movements, and the curve of the contraction does not change by the insertion of an inflated ball. Warming the animal above normal increases the contractions and the tonus of the organ. Cooling the vagina to 37° C. makes the contractions stronger without changing the normal tonus of the organ.

Chloroform mixed with air primarily increases the activity of the vagina, then depresses the tonus and the strength of the contraction, whilst the vagina is more relaxed. Ether, in the beginning, increases the strength of the contractions; then they become less frequent without diminution of their strength. After section of the spinal cord at different levels, and finally after destruction of the whole lumbar cord, the vaginal contractions continue. After section of all the sympathetic branches the contraction still continues. The vagina, automatically, has a rhythmic contraction, due to a nervous system distributed in its walls. The vagina reacts not as a muscle but as an organ endowed with nervous centres. He arrives at the conclusion, that in the lumbar cord is an excitation-centre for the vagina, and in the medulla oblongata an inhibitory centre.—*DuBois' Archiv für Physiologie*, 1884, erstes und zweites Heft.

THE MECHANISM OF DEGLUTITION; ITS IRRITATION AND ITS INHIBITION.—Drs. Kronecker and Meltzer have made another series of experiments upon man. Their conclusions are as follows:

1. When a gum-balloon lies in the first segment of the oesophagus, and two or more acts of deglutition follow whose interval was less than 1-2", then the contraction first ensues after the last act of deglutition. When the balloon lies in the middle segment of the oesophagus, then the intervals between the acts of deglutition can be increased to 3" without the contraction ensuing before the last act; and from the third act of deglutition the swallowings can follow at intervals of 5-6" without a contraction following before the last act of deglutition. These facts show that by every act of deglutition there is inhibition.

2. The pauses between the last act of deglutition and the contraction are longer the greater the number of previous acts of deglutition. The time of the contraction is not influenced.

3. When a second act of deglutition is instituted whilst the first ensuing contraction has already begun in the observed segment of the oesophagus, then this contraction is not removed, and the contraction of the oesophagus corresponding to the second act of deglutition begins as late as the second act of deglutition follows after the end of the first contraction of the oesophagus; in other words, the second motor stimulation is first sent out when the movement first ensuing is over.

4. When a person swallows drinks rich in carbonic acid, there ensues after the fourth act of deglutition a contraction of the oesophagus lasting considerable time. This can not be inhibited by frequent acts of deglutition. By rabbits with the cardiac end of the stomach exposed, there is seen with every deglutition a small dilatation of the cardia.—*DuBois' Archiv*, 1883, Supplement-Band.

HOW QUICKLY IS THE NERVE EXHAUSTED?—Dr. Wedenskii has made a series of experiments upon the subject, using the telephone and the galvanometer. He used the nerve-muscle preparation of the frog and tetanizing induction currents. The irritation of the nerve lasted from one to nine hours, and during this whole time he observed the negative variation by the galvanometer and the telephonic changes.—*Centralblatt f. d. med. Wissenschaften*, 1884, No. 5.

THE PHRENIC NERVES.—Drs. V. Anrep and Cybulski have made a series of experiments upon this subject. The irritation of the central end of the phrenics exercises an influence upon the frequency and depth of the respiratory movements. The effects are different, according to the strength and time of irritation. Section of the vagi or superior laryngeal does not change the effect of the irritation. The irritation of the central end of the phrenic exercises a peculiar influence upon the arterial tension. The first ef-

fect is a more or less marked increase of blood-pressure, followed by a fall which reduces the arterial tension to about normal ; then ensues a second rise, followed by a second fall similar to the waves of Traube-Hering. They reach the conclusion that the phrenic nerves have a special relation to the vaso-motor and the cardio-inhibitory centres. *Pflüger's Archiv*, Band 33, Heft 5 und 6.

THE ACTION OF PILOCARPIN AND ATROPIN ON THE MILK SECRETION.—Dr. D. Hammerbacher has studied the subject, using the cow. Röhrlig has already announced that pilocarpin is no galactagogue, but he believes that it increases the quantity of the milk whilst atropin reduces the amount. *Pflüger's Archiv*, Band 33, Heft 5 und 6.

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b.—MENTAL PATHOLOGY.

CIRCULAR INSANITY.—Tonnini (*Archivio Italiano per la Malattie Nervose*, July, 1883) finds that circular insanity may occur in three forms. In the first type mania and melancholia alternate ; in the second, melancholia and mania ; and the third is the periodic type, in which a lucid period intervenes either between the melancholia and mania, or the melancholia passes into mania, and this is followed by a lucid interval, or the mania passes into melancholia, and this is followed by a lucid interval. The period of depression, according to him, presents few peculiarities. The melancholia is usually a simple melancholia, and rarely of an hallucinatory or delusional type. It may present an atonic phase. The period of exaltation in many respects resembles psychically paretic dementia. According to Karrer and the French authorities the affection is most frequent in females, while the figures given by Krafft-Ebing, Dittmar, Kelp, and Fleming speak for its prevalence in the male sex.

TROPHIC CHANGES IN THE HAIR OF THE INSANE.—Dr. C. Reinhardt (*Virchow's Archiv.*) reports a case of periodical changes in the hair of an epileptic idiot. During the period of excitement the hair changed its color from yellow to red and black ; during the condition of stupor the hair resumed its usual condition. Kiernan (*JOURNAL OF NERVOUS AND MENTAL DISEASE*, April, 1878) called attention to the fact that trophic changes in the hair and skin were frequent in hebephrenia, epileptic insanity, paretic dementia, *folie circulaire*, paranoia, secondary confusional insanity, and periodical insanity. The occurrence of premature grayness in descendants of neuropathic and psychopathic families is not unrelated to the same subject.

BIOLOGICAL RELATIONS OF THE CHILDREN OF PARETIC DEMENTS.—Dr. Régis (*Journal de Médecine de Bordeaux*, Nov. 4,